U.S. Fish & Wildlife Service

Marais des Cygnes

National Wildlife Refuge

Proposed Addition in Bates County, Missouri

Summary

Draft Environmental Assessment

March 2003

Contents

Introduction

The U.S. Fish and Wildlife Service (Service) is proposing to expand the boundary of the 7,500-acre Marais des Cygnes National Wildlife Refuge (Figure 1). The Refuge is located in Linn County in southeast Kansas, and the proposed 11,145-acre addition area is located in Bates County, Missouri, including portions of Homer and Walnut townships (Figure 2).

We believe that there is an opportunity to permanently protect and restore rare habitats within the proposed addition area, specifically prairie, floodplain hardwood forest, and the Marais des Cygnes River. We have identified four alternative approaches to protecting these habitats, and we have evaluated them in a Draft Environmental Assessment (EA). After studying the issues and opportunities, we have identified Alternative C, Protect and Restore Floodplain and Adjacent Upland Habitat along Missouri Reaches of the Marais des Cygnes River by Acquiring Additional Lands, as the preferred alternative. We believe that Alternative C presents the best opportunity for permanently protecting habitat and wildlife, and we believe that pursuing Alternative C would not negatively affect either the local community or landowners. Key conclusions about Alternative C in the draft EA include:

- Alternative C would be the most beneficial alternative for habitat protection.
- Land would be acquired from willing sellers only.
- Impacts on the local economy would be positive due to expenditures associated with habitat restoration and the availability of Refuge Revenue Sharing to compensate for the loss of land on the County's tax rolls.
- Wildlife-dependent recreation opportunities would increase.
- There would be no change in private property rights.

The EA fully evaluates all of the alternatives and their potential impacts. To see the complete EA, call the Refuge at 913/352-8956. The entire EA is posted on the project website, which you can find at http://midwest.fws.gov/planning/maraishome.htm.

This summary of the Environmental Assessment (EA) outlines what the Service is proposing to do, the time frame for the proposed addition, and why the Service is proposing an addition to the Marais des Cygnes NWR.

Figure 1: Marais des Cygnes National Wildlife Refuge Location

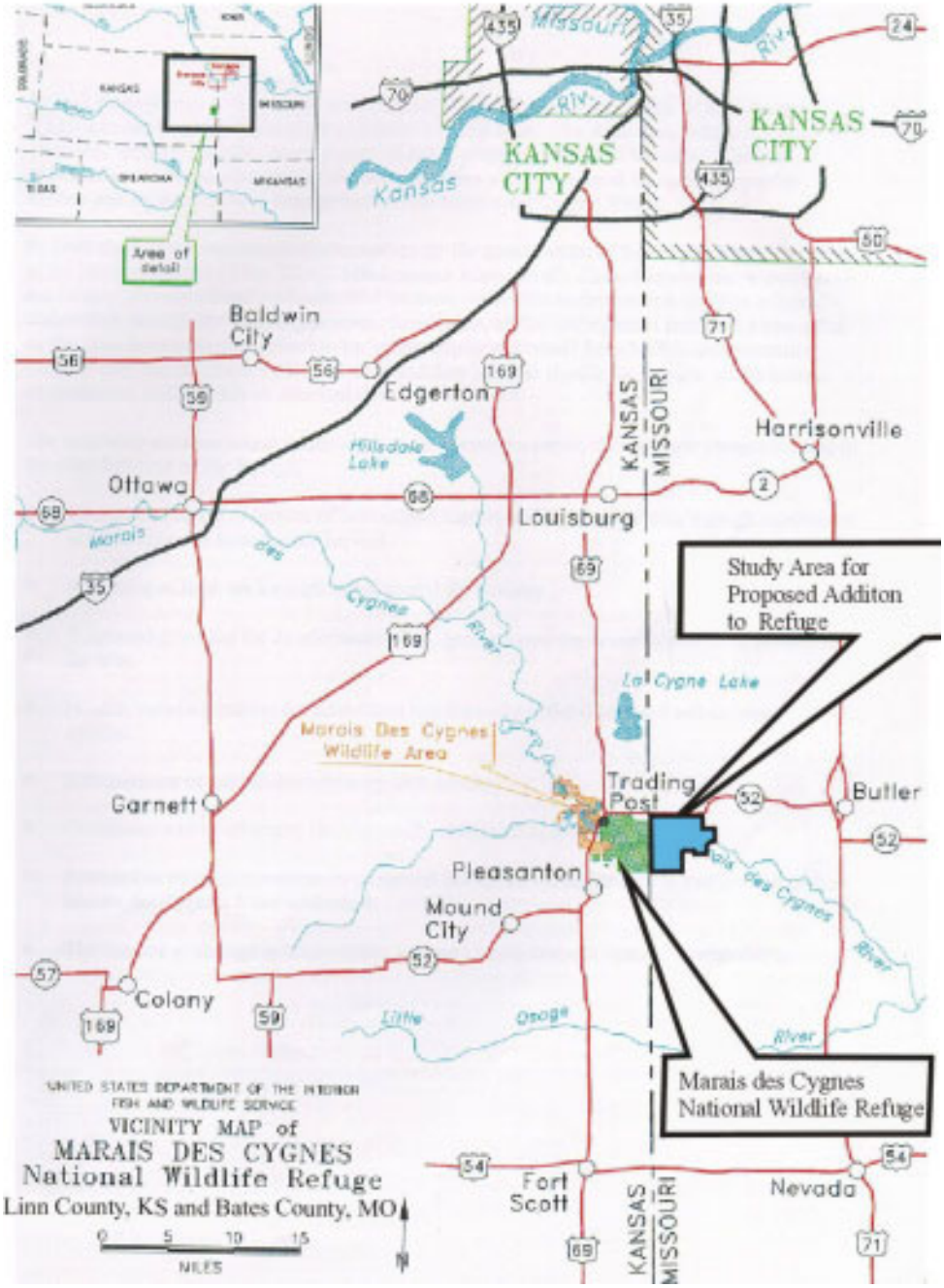
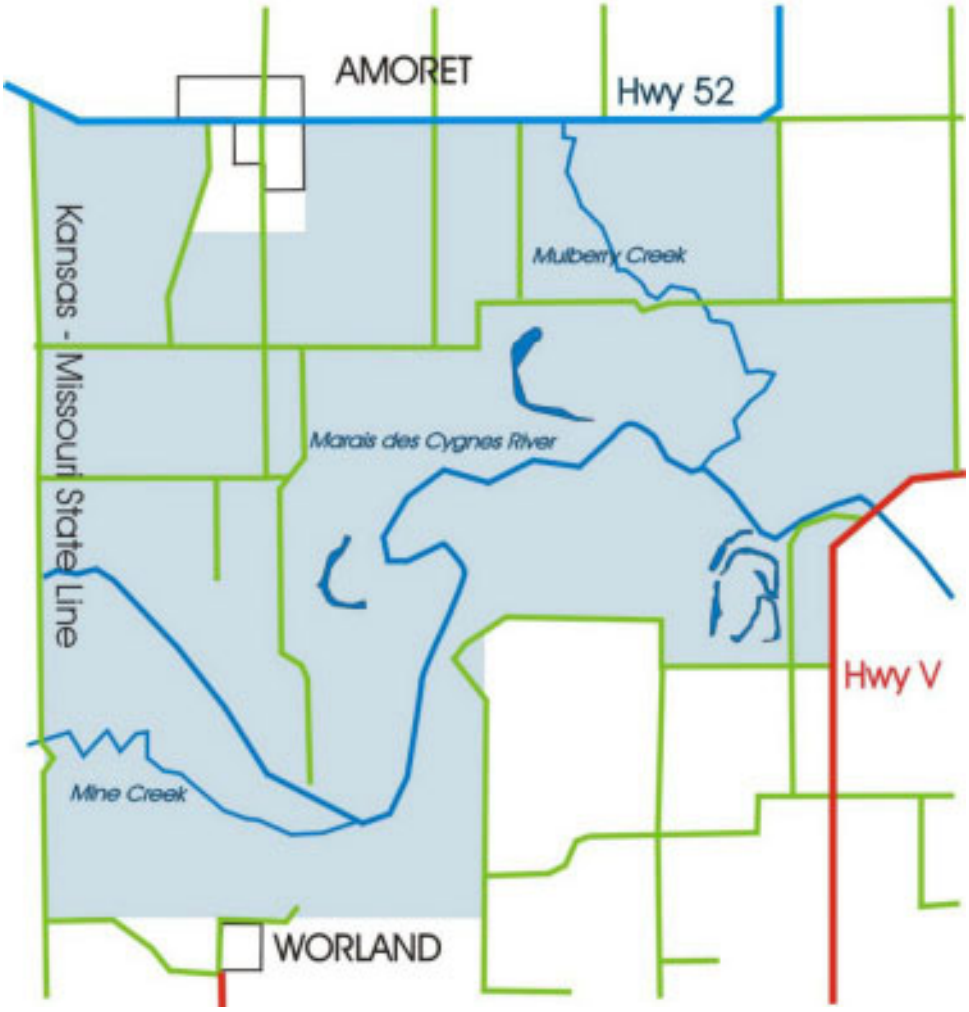


Figure 2: Location of the Proposed Addition to Marais des Cygnes National Wildlife Refuge



Who We Are and What We Do

Marais des Cygnes NWR is administered by the U.S. Fish and Wildlife Service, the primary federal agency responsible for conserving, protecting, and enhancing the nation's fish and wildlife populations and their habitats. The Service oversees the enforcement of federal wildlife laws, management and protection of migratory bird populations, restoration of nationally significant fisheries, administration of the Endangered Species Act, and the restoration of wildlife habitat such as wetlands. The Service also manages the National Wildlife Refuge System.

Refuge lands are part of the National Wildlife Refuge System, which was founded in 1903 when President Theodore Roosevelt designated Pelican Island in Florida as a sanctuary for brown pelicans. Today, the System is a network of over 500 refuges covering more than 93 million acres of public lands and waters. Most of these lands (82 percent) are in Alaska, with approximately 16 million acres

located in the lower 48 states and several island territories. The National Wildlife Refuge System is the world's largest collection of lands specifically managed for fish and wildlife. Overall, it provides habitat for more than 5,000 species of birds, mammals, fish, and insects.

Refuges are great places for people too. When it is compatible with wildlife and habitat conservation, people visit refuges to enjoy wildlife-dependent recreation such as hunting, fishing, wildlife observation, photography, environmental education, and environmental interpretation. Many refuges have visitor centers, wildlife trails, automobile tours, and environmental education programs. Nationwide, approximately 30 million people visited national wildlife refuges in 1997.

Marais des Cygnes National Wildlife Refuge

The Refuge is named after the Marais des Cygnes River, which runs through the middle of the Refuge and is the dominant natural feature of the region. The name is French and means "Marsh of the Swans." It is presumed that Trumpeter Swans, which were historically common in the Midwest, used the wetlands adjacent to the River during spring and fall migration.

The Refuge was established in 1992 for the protection and restoration of floodplain hardwood forest. Approximately 5,000 acres of the existing 7,500-acre Refuge are available for wildlife-dependent recreation that includes hunting, fishing, environmental education and interpretation, and wildlife photography and observation. A 2,500-acre wildlife sanctuary is not available for public use.

Purpose and Need for Action

Purpose

The draft EA describes and evaluates the range of options available for restoring, enhancing, and protecting wetland and upland habitats within the proposed new addition (Addition) to the Marais des Cygnes NWR. The proposed Addition could eventually restore and permanently protect a total of 11,145 acres including 5,255 acres of floodplain hardwood forest with associated shallow and deepwater wetlands, 5,890 acres of tallgrass prairie and savannah, 7.2 miles of large streams, and 8.8 miles of river.

The EA also publicly discloses the direct, indirect, and cumulative effects of each strategy on the quality of the human environment, as required by the National Environmental Policy Act of 1969 (P.L. 91-190), as amended).

Need for Action

The addition to Marais des Cygnes NWR described in this summary is an attempt to prevent further fragmentation and degradation of the rare habitats found in the area. Large, contiguous blocks of habitat benefit many species of

Service interest that are sensitive to the impact of other competing species due to the "edge effect" of small habitat blocks.

For example, native prairie has declined by 99.67 percent in Missouri, and there is a critical need to protect and restore the remnant prairie found on the Refuge. Protection of the Addition area in Missouri, in conjunction with the adjacent Marais des Cygnes National Wildlife Refuge and Marais des Cygnes Wildlife Area in Kansas, and with successful land acquisition, could protect a continuous block of 27,000 acres of wildlife habitat and 27 miles of river.

Large blocks of floodplain hardwood forests and their associated wetlands, which are critical habitat for trust species such as the Red-shouldered Hawk, the Cerulean Warbler and the broadhead skink, are also one of the needs that this proposal addresses. The Red-shouldered Hawk and the Cerulean Warbler are rare/declining species and habitat degradation has been identified as a factor contributing to their decline.

Prairie rivers throughout the Midwest have lost many species of fish and mussels due to changes in hydrology, siltation, and pollution. There is a need to protect relatively unmodified prairie rivers from further habitat degradation.

Alternatives

Four alternative courses of action were evaluated in the draft EA. The following paragraphs summarize those options. Alternative C, Protect and Restore Floodplain and Adjacent Upland Habitat Along Missouri Reaches of the Marais des Cygnes River by Acquiring Additional Lands, is the preferred alternative and is discussed in this summary in detail. For a full discussion how each alternative would address the issues and opportunities and the environmental consequences of each alternative, see the full draft EA.

Explanation of Alternatives

Alternative A: No Action

Marais des Cygnes NWR operations would continue at the current level, entirely in the State of Kansas. The 7,500 acres of current holdings could be expanded by acquiring additional lands within the original approved acquisition boundary encompassing 9,300 acres. Management efforts would be directed toward achieving existing resource goals in Kansas.

Alternative B: Protect and Restore Habitat in the Marais des Cygnes Floodplain in Missouri Through Land Acquisition

Purchase additional lands, fee title, only in the floodplain, in order to expand the Refuge capability to protect, restore and preserve floodplain habitat associated with the Marais des Cygnes River by extending the Refuge into the Marais des Cygnes/West Osage River Basin of Missouri.

Alternative C: Protect and Restore Floodplain and Adjacent Upland Habitat Along Missouri Reaches of the Marais des Cygnes River by Acquiring Additional Lands (Preferred Alternative)

Purchase additional lands, fee title, in order to expand the Refuge capability to protect, restore and preserve floodplain, wetland, and native prairie habitat on lands adjacent to and nearby the Marais des Cygnes River in Marais des Cygnes/ West Osage Basin of Missouri. The main difference between Alternative C and Alternative B is that Alternative B primarily targets the floodplain with restoration of wetlands and floodplain hardwoods as primary goals while Alternative C includes these goals as well as the protection and restoration of native prairie on the uplands adjacent to the floodplain.

Alternative D: Protect and Restore Additional Floodplain and Adjacent Uplands through Long-term Easements and Private Land Programs

Expand the Refuge's capability to protect and restore floodplain and upland habitat on private lands entirely through easements and agreements with land owners.

Alternatives Considered but Eliminated from Detailed Study

The following alternatives were considered early in the planning process. These alternatives were discussed by the planning team but were not considered to be viable alternatives.

East Highway V Addition

Extend the boundary east of Highway V to include the downstream reach of the River that is transected by the portion of the Bates County Drainage Ditch, which was not dug deep enough to carry River flows except during flood events. This reach includes 3 miles of drainage ditch and 6 miles of River. While this reach of River does have wildlife values, flood events are impacted by the drainage ditch and extensive levees. Much of the floodplain is in cropland and little native vegetation remains. Restoration of this reach of the River would be both controversial and expensive.

Mulberry Creek Addition

Extend the boundary north of Highway 52 along Mulberry Creek. This area contains floodplain hardwood and fescue pasture. It is not impacted by levees or drainage ditches and little cropland is present. While habitat values are significant, the floodplain is very narrow. Flooding from the Marais des Cygnes River rarely backs into this area and Mulberry Creek does not have a large enough watershed to routinely flood, thus wetland values are limited.

East Worland Addition

Extend the boundary south to include a large forested area east and south of Worland. This area is a very rugged terrain created by turn-of-the-century open-pit mining. Most of the area is covered by oak-hickory forest and mine ponds. This type of habitat is often purchased throughout eastern Kansas and western

Missouri as wildlife habitat by both private and state interests. However, it does not lend itself well to meeting the above goals. It is also a habitat that is not under great threat.

Affected Environment

The proposed Addition area is located in west-central Missouri in Bates County, approximately 10 miles west of Butler, Missouri. The area contains 11,145 acres between the Missouri state line and County Highway V. The existing 7,500-acre Marais des Cygnes NWR and Marais des Cygnes Wildlife Area (7,500 acres) are located immediately west of the Addition area.

The Addition area is located within the Osage Cuestas subdivision of the Osage Plains Physiographic region. The Osage Cuestas are characterized by forested southwest-northeast trending limestone ridges with valleys (Bare 1979) containing high quality tracts of prairie scattered amid expanses of fescue pasture. River and stream valleys in the region are dominated by cropland and pasture with scattered tracts of floodplain hardwood forest.

The Marais des Cygnes River, which meanders through the study area, is a major tributary of the Osage River, which in turn is a tributary of the Missouri River. Floodplains within the mid reach of the River are generally 1.5 miles in width. Numerous oxbow wetlands of various depth were historically found throughout much of the floodplain. Many of the wetlands in the Addition area have been either fully or partially drained. Original wetlands still exist throughout portions of the floodplain, however. The largest wetlands in the area are 20-30 acres in size.

Prior to 1911, the Missouri portion of the Marais des Cygnes River was 52 miles in length. In 1911 the Bates County Drainage Ditch was constructed. The ditch traverses the Marais des Cygnes River valley from just downstream of the Addition area to its confluence with the Osage River, a distance of 23 miles. The reach of river along the drainage ditch was previously 43 miles long. The drainage ditch shortened the River by 17 miles (Dent et al. 1998). This shortening, along with significant channel downcutting and construction of levees, has significantly reduced flooding of the floodplain along this reach of the River and has facilitated the presence of a number of corporate farming operations. Today, the Missouri portion of the Marais des Cygnes River is comprised of 15 miles of the original river and 20 miles of drainage ditch (the first 3 miles of the drainage ditch do not carry water except during high flows).

Historically, much of the uplands of the study area were dominated by tallgrass prairie with savannah groves in areas less prone to fire. The floodplains of the Marais des Cygnes River and larger tributaries were dominated by floodplain hardwood forest with wet prairie on more moist and fire prone sites.

The Osage Cuestas region once supported large populations of free-roaming bison, elk, waterfowl and prairie chickens. Forests of pin oak, pecan, Shumard oak, and shellbark hickory provided winter cover and protection from prairie fires for large ungulates as well as habitat for wolves and black bear.

Today, bison and elk herds, wolves and black bear are gone and little remains of this vast prairie/forest complex. Remnant tallgrass prairies found on portions of the study area are now grazed by cattle or hayed. Osage orange, persimmon, and plum have established themselves along fencelines throughout the area. Post oak and blackjack oak savannahs, located on some of the drier hilltops, have largely become woodlands.

Despite these changes, many prairie and forest species still exist in the Addition area. In addition, large expanses of native tallgrass prairie in the Kansas Flint Hills, to the west of the study area, and large expanses of oak-hickory forest in the Missouri Ozarks, to the east of the study area, offer significant opportunities for natural recolonization by prairie and forest species not currently found in the area.

River Hydrology

The Marais des Cygnes River is a sub-basin of the Osage River, which flows into the Missouri River near Jefferson City, Missouri. The mainstem of the Marais des Cygnes River is approximately 177 river miles in length from the Kansas-Missouri state line to its headwaters west and south of Topeka, Kansas. An additional 35 miles of the River occur in Missouri for a total length of 221 miles. Upstream from the state line, it drains an area of approximately 3,300 square miles. Major tributaries of the River are Big Sugar Creek, Big Bull Creek, Pottawatomie Creek, Dragoon Creek, Hundred and Ten Mile Creek, Mine Creek, and Mulberry Creek.

The natural flow of the River has been significantly affected by construction of several major impoundments by the U.S. Army Corps of Engineers; these dams control 23 percent of the watershed (Dent et al. 1998). Another factor affecting flows is retention of overbank flows in wildlife refuge ponds at Marais des Cygnes Wildlife Management Area, operated by the State of Kansas. Retention in these ponds amounts to 5,500 acre-feet annually. In addition, the flows are affected by power developments and numerous small diversions for stock ponds and irrigation (U.S. Fish and Wildlife Service 1992)).

Flood events generally occur every 8 out of 10 years for the years 1960-2000. Average flood frequency at the gauge for this period is two to three times per year. The greatest number of flood events per year was eight. The average depth of water above the riverbank was 4 feet with a high of 10 feet (Gleason 2001).

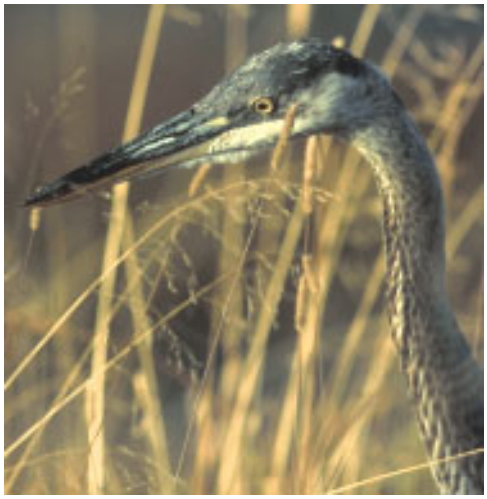
River Water Quality

Erosion and sedimentation from agricultural lands do cause water quality problems in the Marais des Cygnes River, especially during periods of moderate to high flows. During low flow periods in the summer and winter, River clarity increases dramatically. The quality of water in the River may perhaps best be determined by a close study of the River's mussel population. Currently, 23 species have been found living in the River at Marais des Cygnes NWR.

Acid mine drainage and high iron and sulphate levels occur in portions of Mulberry Creek, a tributary located within the Addition area. However, the stream is not considered acidified. Mining ceased within the watershed in 1989 and, as a result of this, water quality is expected to improve with time (Dent et al. 1997).

Description of Habitat

Wetlands



Wetlands are largely confined to the floodplain of the Marais des Cygnes River and two of its larger tributaries, Mine Creek and Mulberry Creek. Shallow wetlands are found throughout floodplain hardwood forest tracts. These wetlands are quickly recharged by local rain events. Oxbow wetlands are much deeper and rarely go dry. Large open wetlands are generally created by man-made dikes for waterfowl hunting.

Approximately 370 acres of oxbow wetlands and wetlands managed for waterfowl hunting occur in the Addition area.

Floodplain and Upland Forests

Approximately 35 percent of the original floodplain hardwood forest acreage still occurs within the floodplain of the Addition area. The area contains approximately 1,675 acres of upland forest and 1,840 acres floodplain forest. Forests cover approximately 32 percent of the Addition area.

Tallgrass Prairie and Other Grasslands

Much of the tallgrass prairie in the Addition area has been replaced by forest, cropland, and fescue pasture. Remaining tracts are generally less than 40 acres in size, are grazed or hayed, and vary in quality from poor to high. High quality tracts contain 100 to 200 species of plants. Common prairie species are Indian grass, big bluestem grass, gama grass, compass plant, pale purple coneflower, and prairie blazing star. Examples of dry rock prairie, mesic prairie, and wet prairie can all be found in the area.

Fescue pasture is the predominant cover type on the uplands. This non-native grass is able to withstand tremendous grazing pressure and therefore was widely planted to replace native grasslands that had become dominated by annual weeds due to season-long grazing. Some fescue grasslands harbor a great diversity of native prairie plants and can be returned to native prairie with careful management. Other fescue stands must be farmed or sprayed if fescue is not desired. The largest fescue stands occur in the northwestern portion of the Addition area where they were planted after the area was mined and reclaimed.

The area contains 430 acres of tallgrass prairie (estimate) and 5,020 acres of fescue and other grasses. Grasslands cover 49 percent of the Addition area.

Cropland

Crops commonly grown in the area include corn, milo, soybeans, and winter wheat. Crops provide food and cover for many species of wildlife but only during certain times of the year.

Most cropland within the floodplain is not protected by levees and is thus subject to river flooding. A number of corporate farming operations are located immediately downstream of the Addition area where the Bates County Drainage Ditch and levees have reduced the likelihood of flooding.

Approximately 1,740 acres of cropland occur in the addition area, of which 230 acres occur on the uplands and 1,510 occur in the bottoms. The percentage of croplands is 2 percent of the uplands, 29 percent of the floodplain, and 16 percent of the Addition Area.

Prairie River

An 8.8-mile reach of the Marais des Cygnes River and the last 3.7 miles of Mine Creek and 3.5 miles of Mulberry Creek travel through the Addition area. The River contains three rock riffles with associated gravel bars, which are believed to be important for paddlefish and walleye spawning (Dent et al. 1997) as well as mussel habitat. Approximately 1.5 miles (20 percent) of the 8.8-mile reach of the River contains exposed rock substrate in and along the River.

One levee, 2.1 miles long, occurs along a portion of the south bank of the Marais des Cygnes River within the Addition area. The bank opposite of this levee exhibits significant erosion, probably in part due to the presence of the levee but also because all streamside forest has been removed. Another levee is located along the lower reach of Mine Creek and is 1.9 miles in length. This levee does not prevent flooding from the Marais des Cygnes River, however. The land behind the levee is in fescue pasture. Mulberry Creek also has one levee along it that is 2.2 miles in length. The total area of floodplain behind levees is 444 acres, 8 percent of the floodplain.

Two dams, Bagnell (1931) and Truman (1979), are located downstream of the Addition area. These reservoirs do not impact flooding of the area but nevertheless have significant impacts on aquatic species, especially mussels. A severe drought, even if it occurs only once or twice a century, could easily reduce or eliminate some populations in the upper watershed as there is no longer a means for downstream populations, whose young disperse by attaching to fish, to recolonize above the dams. However, upstream reservoirs have greatly lessened the intensity, frequency, and duration of low water events (< 5 cfs) (Gleason 2001) and therefore have to some degree mitigated the negative effects of downstream dams.

The Current Ecological Condition

Fish and Wildlife

Mammals

The proposed Addition area supports a variety of resident mammals including white-tailed deer, opossum, raccoon, wood and cotton rat, gray, fox, and flying squirrel, red and gray fox, coyote, otter, bobcat, and nine-banded armadillo. A total of 41 mammal species are likely to occur in the addition area (U.S. Fish and Wildlife Service 1998).

Reports of wild hogs and mountain lions occur occasionally. No populations are believed established in the area. However, the Schell-Osage Wildlife Area, 30 miles southeast of the Addition area, enacted an eradication program in 2000 to prevent a small population of wild hogs from becoming established in the area.

Birds

A Comprehensive Conservation Plan for Marais des Cygnes NWR lists the presence of 317 species of birds including 31 waterfowl and 36 warbler species. A total of 109 species of birds nest on the Refuge.

Wetlands are important stopover sites in the spring and fall for many migratory birds. Puddle ducks, including Mallards, Wood Ducks, Gadwall and Blue-winged Teal, and Canada Geese are frequently observed where wetlands are available. Resident Canada Geese (giant) use open water wetlands for nesting. Canada Geese and Mallards concentrate in large numbers on river riffles that remain open throughout the winter. These sites provide hunting opportunities for people and Bald Eagles.

In general, fall waterfowl populations at Marais des Cygnes Wildlife Area average 30,000 with peaks of 60,000 (Karl Karrow, personal communication). Waterfowl populations at August A. Busch Four Rivers Wildlife Area generally average 75,000 with peaks of 100,000 (Josh Cussimanio, Personal communication). Most waterfowl use is by ducks, particularly mallards. Waterfowl migrate back and forth between these two areas and can be expected to readily utilize any wetlands that are restored in the Addition area. Marais des Cygnes Wildlife Area is located 4 miles west of the Addition area and Four Rivers Wildlife Area is located 20 miles southeast of the Addition area.

A number of Great Blue Heron rookeries are located along the mid reach of the Marais des Cygnes River. Greater Prairie Chickens are occasionally seen in the area. The nearest active dancing grounds, or leks, occur 25 miles to the southwest of the Addition area near Blue Mound, Kansas, and 30 miles to the southeast of the Addition area near Nevada, Missouri. The leks are gathering sites where male Prairie Chickens display to attract females during the breeding season.

The following migratory bird species are listed as Resource Conservation Priorities by Region 3 of the U.S. Fish and Wildlife Service, and would benefit from the proposed project: Bald Eagle, Wood Thrush, Piping Plover, Interior Least Tern, Loggerhead Shrike, Grasshopper Sparrow, and Dickcissel.

The following additional bird species listed as Endangered by the State of Missouri would also benefit from the project: Barn Owl, Northern Harrier, King Rail, American Bittern, Snowy Egret, and possibly the Greater Prairie Chicken (Missouri Department of Conservation websites).

Other birds also likely to benefit include Cerulean Warbler, Bell's Vireo, Red-shouldered Hawk, Henslow's Sparrow, Scissor-tailed Flycatcher, Short-eared Owl, and Painted Bunting.

Fish and Mussels

A total of 48 species of fish have been collected from the Marais des Cygnes River and tributaries in Missouri since 1986 (Dent et al. 1998). Walleye, white bass, and paddlefish migrate to river gravel bars located within the Addition area to spawn. The spawning sites for paddlefish that occur within Marais des Cygnes NWR and the Addition area may be among the most important within the West Osage River Basin (Dent et al. 1998). The paddlefish is listed on a "Watch List" in Missouri.

Limited surveys conducted since 1998 at Marais des Cygnes NWR have documented a total of 30 species of mussels living within the Marais des Cygnes River and adjacent floodplain wetlands. Based on recent discoveries of non-relict shells and upstream discoveries, additional species will likely occur.

Reptiles and Amphibians

Approximately 58 species of snakes, lizards, frogs, salamanders, and turtles are likely to occur in the Addition area (Marais des Cygnes NWR CCP) of which 16 are amphibians and 42 are reptiles. The northern crawfish frog and great plains skink are two species that are likely in the Addition area and are uncommon in Missouri.

Threatened and Endangered Species

Ten federally listed threatened or endangered species may occur in the Addition Area, four of which - Bald Eagle, Interior Least Tern, Piping Plover, and Mead's milkweed - have been observed within or near the Addition area. Pink mucket mussel, winged mapleleaf mussel, scaleshell mussel, American burying beetle, western prairie fringed orchid, and running buffalo clover historically occurred in the area and may still occur or be restored to the area.

A population of Mead's milkweed occurs at Marais des Cygnes NWR within a short distance of the Addition area and likely occurs within existing prairie areas in the Addition area.

Bald Eagles are common winter visitors along the Marais des Cygnes River, especially where rock riffles keep water open and attract large concentrations of geese and Mallards. Active Bald Eagle nests occur 40 miles upstream (northwest) of the Addition area at Hillsdale Reservoir, Kansas, and 30 miles downstream (southeast) at Schell-Osage Wildlife Area, Missouri.

Thirteen species listed as endangered in Missouri may occur within the Addition area, 10 of which have been observed within or near the Addition area. Bald Eagle, Barn Owl, Northern Harrier, King Rail, American Bittern, Snowy Egret, Interior Least Tern, Greater Prairie Chicken, black tailed jackrabbit, and Mead's milkweed have been observed within or near the Addition area. American burying beetle, western prairie fringed orchid, and running buffalo clover may occur in the area but have not been recently observed (Missouri Department of Conservation websites).

Biological Diversity

The Addition area contains a tremendous variety of plants and animals for an area of its size. Located within the transition zone of two biomes, tallgrass prairie and the eastern deciduous forest, and between two high quality representatives of these biomes, the tallgrass prairie of the Flint Hills of Kansas and the oak-hickory forest of the Ozarks of Missouri, the region has tremendous potential, with management, to increase in diversity. The presence of the Marais des Cygnes River and its associated floodplain further adds to the diversity of the area.

A total of 317 species of birds, 41 mammals, 58 reptiles and amphibians (Marais des Cygnes NWR CCP), 48 fish (Dent et al. 1998), and 30 mussels (Marais des Cygnes NWR staff) occur in the area for a total of 494 different animal species. This number includes a tremendous variety of aquatic, forest, and prairie species all within a short distance of each other, such as Cerulean Warbler and Red-shouldered Hawk in forests, Loggerhead Shrike and Scissor-tailed Flycatcher in shrublands, Henslow's Sparrow and Short-eared Owl in grasslands, flat floater mussels and Green Herons in wetlands, and paddlefish and Hooded Merganser along the River.

Plant community diversity is equally great with examples of prairie and woodland sites containing dry, mesic, and wet species associations. Some representative prairie species of each community association include prickly pear cacti on dry sites, big bluestem on mesic sites, and cordgrass on wet sites. Some representative woodland species of each community association include black jack oak on dry sites, shagbark hickory on mesic sites, and pin oak on wet sites. American lotus, an emergent, and Potamogeton spp., a submergent, are some representative aquatic species.

Many typically southern species occur at their northern limits in the region including pecan, persimmon, and paw paw. Other species that are commonly found farther north, such as bur oak, occur as a southern subspecies. The southern subspecies of bur oak is readily recognized from the northern subspecies by its location in wet rather than dry sites and by the much larger nut size.

Environmental Consequences

Environmental Consequences Related to Natural Resource Concerns

The anticipated environmental consequences of each of the four alternatives are described in detail in the draft EA. This summary describes the expected consequences of the preferred alternative, Alternative C, Protect and Restore Flood-

plain and Adjacent Upland Habitat along Missouri Reaches of the Marais des Cygnes River by Acquiring Additional Lands (Preferred Alternative). Table 1 provides a brief summary of the environmental consequences of all four alternatives.

Under this alternative, the Service would purchase additional lands, fee title, in order to expand the Refuge capability to protect, restore and preserve bottomland, wetland, and native prairie habitat on lands adjacent to and nearby the Marais des Cygnes River in Marais des Cygnes/West Osage Basin of Missouri.

The main difference between Alternative C and the other land acquisition alternative, Alternative B, is that Alternative B primarily targets the floodplain with restoration of wetlands and bottomland hardwoods as primary goals while Alternative C includes these goals as well as the protection and restoration of native prairie on the uplands adjacent to the floodplain.

This alternative is preferred by the U.S. Fish and Wildlife Service because it provides the broadest and most permanent form of protection to natural resource values of the targeted reach of the Marais des Cygnes River in Missouri.

The consequences of Alternative C are described for each of the following natural resource concerns and goals.

Protect and increase the diversity and abundance of migratory bird and waterfowl species dependent on bottomland hardwood and tallgrass prairie habitats.

Bottomland cropland and grassland sites would be planted to bottomland hardwood forest or restored to wetland. Fescue grassland sites that were wet prairie, according to the 1857 land survey, would be restored to wet prairie. Most of the bottomland was not historically wet prairie, therefore wet prairie restoration would be limited.

The forests of the bottomland would change from a fragmented landscape of many small forests of mostly young trees to a landscape of large tracts of forest with many mature trees. The forests would be interspersed with many shallow, depressional wetlands and deeper oxbow wetlands.

Wetlands would not be routinely filled in the fall and drained in the spring, as most duck marshes are, which would provide summer breeding habitat for many species of marsh birds.

Species requiring expansive tracts of bottomland forest and mature trees will increase, including Red-shouldered Hawk and Cerulean Warbler. Many other species such as, broad-head skink, flat-floater mussel, Wood Duck, and Hooded Merganser would also benefit.

Protect and increase the diversity and abundance of migratory bird and waterfowl species dependent on bottomland hardwood and tallgrass prairie habitats.

Fescue grasslands would be managed to lessen or remove fescue in favor of native prairie species. Management efforts could include short-term farming, early spring herbicide application, late spring burns, and intense spring-fall

Table 1: Summary of Issues and Consequences by Alternative

Issue (How will each alternative affect each issue?)	Alternative A (No Action)	Alternative B Protect and Restore Habitat in Marais des Cygnes Floodplain in Missouri through Land Acquisition	Alternative C Protect and Restore Floodplain and Adjacent Upland Habitat along Missouri Reaches of the Marais des Cygnes River by Acquiring Additional Lands (Preferred Alternative)	Alternative D Protect and Restore Additional Floodplain and Adjacent Uplands through Long-term Easements and Private Land Programs
Accomplishing habitat & wildlife management goals	Little to no benefit	Significant Benefit	Significant Benefit	Slight Benefit
Recreational Opportunities	Limited public opportunities	Expanded public opportunities	Expanded public opportunities	Limited public opportunities
Taxes	No Change	Decrease balanced by Revenue Sharing	Same as Alternative B	No Change
Local Economy	No Change	Benefit	Benefit	No Change
Landowner Rights	No Change	No Change	No Change	No Change
Service Land Acquisition	None	Fee & easement acquisition plus voluntary agreements	Same as Alternative B	None
Revenue Sharing	None	Likely to exceed current taxes	Likely to exceed current taxes	None
Relocation Benefits	None	Available	Available	None
Cultural Resources	No Change	Neutral to slight improvement in protection	Same as Alternative B	No Change

Issue (How will each alternative affect each issue?)	Alternative A (No Action)	Alternative B Protect and Restore Habitat in Marais des Cygnes Floodplain in Missouri through Land Acquisition	Alternative C Protect and Restore Floodplain and Adjacent Upland Habitat along Missouri Reaches of the Marais des Cygnes River by Acquiring Additional Lands (Preferred Alternative)	Alternative D Protect and Restore Additional Floodplain and Adjacent Uplands through Long-term Easements and Private Land Programs
Private Drainage	No Change	No Change	No Change	No Change
Water Pumping	No Change	No Change	No Change	No Change
Crop Depredation	No Change	Decreased goose depredation; possible static or slight increase in deer depredation	Same as Alternative B	No Change
Refuge Administration	None	Staff, salaries, and operating funds phased in over time	Same as Alternative B	None
Public Roads	No Change	No change without approval of entity controlling roads	Same as Alternative B	No Change
Cumulative Impacts	No Change	Positive impact on the social and natural environment	Same as Alternative B	Same as Alternative B
Environmental Justice	No Change	Benefit	Benefit	No Change
Cemetery Access	No Change	No Change	No Change	No Change

grazing. The types of management actions taken would largely depend on the plant and animal diversity present on the site.

Restored grasslands would likely be managed with a combination of grazing and prescribed fire. Grazing would likely be rest-rotational, which would allow a diversity of grassland heights and density and prevent individual species of native plants from being eliminated from an area due to grazing pressure. Haying would not be frequently employed.

Trees along fence rows and draws would be removed to reduce perches for avian predators and grassland fragmentation. Large patches of upland forest would not likely be removed but may be restored to savannah if species such as bur oak and post oak are present.

The increase in native plant diversity, diversity of grassland heights and density, and reduction of grassland fragmentation should greatly increase the abundance and diversity of grassland birds.

Some of the migratory bird species likely to be benefitted are: Barn Owl, Short-eared Owl, Northern Harrier, Swainson's Hawk, Loggerhead Shrike, Upland Sandpiper, Bell's Vireo, Henslow's Sparrow, Grasshopper Sparrow, Dickcissel, and Scissor-tailed Flycatcher.

Protect and restore Federal and State Threatened and Endangered Species.

Mead's milkweed likely occurs on some of the native prairie sites. The greatest threats to these populations are invasion by *Lespedeza cuneata*, an aggressive noxious weed, and subsequent control with broadcast application of herbicide. Management efforts would strive to identify all Mead's milkweed populations and carefully spot-spray *Lespedeza* plants near the sites with an approved herbicide such as Garlon. Other threats to sites are herbicide drift from adjacent pastures or crop fields and invasion by forest. All Mead's milkweed sites would be protected with large buffers of restored prairie.

American burying beetle and running buffalo clover likely occurred in the area historically. No populations are known to exist in the area. Restoration potential of these species would be periodically evaluated as prairie restoration efforts advance.

Conserve, manage, and restore the diversity and viability of native fish, wildlife and plant populations associated with bottomland hardwood and tallgrass prairie.

Black-tailed jack rabbit, Greater Prairie Chicken, and Bobwhite Quail would be benefitted by grassland restoration efforts. All of these species are in serious decline in the region. Many factors are likely affecting population declines. However, the dominance of fescue grass, increased presence of trees and mature upland forest, and fragmentation of grasslands are likely major factors affecting these and other native grassland species.

Efforts to restore native prairie, reduce the presence of upland trees, and eliminate grassland fragmentation should help native grassland species.

Work in partnership with others, including private landowners, to restore or enhance bottomland hardwood, tallgrass prairie, and other unique plant communities.

Private landowners adjacent to and within an approved acquisition boundary would be encouraged to conduct restoration of native prairie. Efforts would especially concentrate on sites where restoration would create large tracts of grassland.

Restore, enhance, and protect water quality and quantity that approaches natural hydrologic functions.

Grasslands would be managed to leave more litter on the ground, which would lessen erosion. Crop fields would be planted to grass, which would further reduce erosion.

Consequences of Alternatives Related to the Socioeconomic Environment

This section examines the alternatives regarding their respective ability to address the following social goals:

1) Provide for compatible wildlife-dependent recreational uses by the public.

2) Emphasize increased public understanding of bottomland hardwood forest and tallgrass prairie ecosystems and the mission of the National Wildlife Refuge System.

This section also examines the potential effects on some key issues, including tax revenue and the local economy, that may result from the acquisition, operation, and maintenance of a national wildlife refuge in the study area.

Recreational Opportunities

The opportunity for wildlife-dependent public recreational uses would increase under alternative C. The Refuge Improvement Act of 1997 identifies six priority uses as wildlife-dependent recreational activities: hunting, fishing, wildlife observation, photography, environmental education, and interpretation. These uses are encouraged on refuges when they are compatible with the purposes of the refuge. All lands acquired for refuges are closed to all public uses unless specifically opened. Prior to, or soon after lands are purchased of sufficient size and location to allow public uses, appropriate management plans and the Refuge Comprehensive Conservation Plan will be amended to include the Addition area. It is anticipated that all six priority uses will be allowed as soon as a sufficient land base is acquired within the Addition area. Public recreational uses are currently permitted on Marais des Cygnes National Wildlife Refuge in Kansas.

Taxes

Land acquisition under Alternative C would likely occur over 20 years or more. The extent of fee ownership by the Service is difficult to predict as it depends on

the landowner's desire to sell land and whether buildings are included. It is also difficult to predict future tax assessments over such a long period. Any lands acquired in fee/full title by the Service will no longer be on the local taxing jurisdiction's property tax rolls. However, Refuge Revenue Sharing should provide tax revenues equal or greater than current revenues.

The Refuge Revenue Sharing Act authorizes payments based on the greatest return to the county and is calculated under one of three formulas:

1) 75 cents per acre;

2) 25 percent of the net revenue from sales of local Refuge products; or

3) three-quarters of 1 percent of the appraised value of the property. Appraised value is evaluated on the type of land use at the time of purchase by the Service and is re-evaluated every 5 years. If the land was being hayed or grazed at the time of purchase it will always be re-evaluated as that land use, regardless of the use the Service makes of the land.

Recent Revenue Sharing payments made to counties on Service lands at Big Muddy National Wildlife Refuge near Columbia, Missouri, consistently presented payments greater than what was previously received when the land was in private ownership, even on leveed crop fields (Tom Bell, Refuge Manager).

The conversion of existing agricultural lands to native wetlands and prairie will require little or no new local government services. The tax burden for road construction or repair may be reduced by the presence of a wildlife refuge and could help eliminate any future tax shortfall.

The Local Economy

The local economy can experience some changes during the formation of a new national wildlife refuge. Under Alternative C, the proposed Addition would likely create increased spending in the area by visitors to the Refuge, reduced agricultural production comparable to the Conservation Reserve Program, and increased expenditures by the Service to build and maintain Refuge facilities. In addition, the new Addition would likely require additional staff, equipment, and facilities.

The Addition area would likely be developed over the course of 20 years or more. During that time, funds would be needed for engineering and construction. Several hundred thousand dollars would be expended returning the lands to wetlands, bottomland hardwood forest, and native prairie. This money would be expended locally for items such as native grass seed, fuel, and contracts with heavy equipment operators for wetland restorations.

In summary, the Addition proposed to Marais des Cygnes National Wildlife Refuge under Alternative C would likely have a net positive effect on county-level economic activity and could generate considerable social benefits. The value of natural areas, such as wildlife refuges, to people and their quality of life is difficult to measure in conventional economic terms. National wildlife refuges enhance the regional, state and the nation's stock of natural assets and provide

important, but less tangible, benefits to its citizens, including clean water, natural beauty and abundant wildlife, fish and plants. Nevertheless, the Service recognizes that potential changes in the local and regional economy are important considerations.

Consequences of Alternatives Related to Local Land Use Including Land Acquisition, Refuge Management and Administration

This section examines potential effects on landowners and local residents that may result from the acquisition, operation and maintenance of a national wildlife refuge in the study area. The full draft EA includes a Land Protection Plan that details options for land protection and Service priorities by individual tracts within the proposed Refuge Addition area. Figure 4 on the following page provides an overview of the Service's land acquisition priorities for this proposal.

Landowner Rights Adjacent to Refuge Lands

If an Addition to the Refuge is established, the Service would have no more authority over private land within or adjacent to the boundaries of the Refuge than any other landowner. Landowners within a project boundary retain all of the rights, privileges, and responsibilities of private land ownership. The presence of refuge lands does not afford the Service any authority to impose restrictions on any private lands. Control of access, land use practices, water management practices, hunting, fishing, and any other general use is limited to those lands in which the Service has purchased a real estate interest or rights.

Owning land adjacent to Service land does not change any regulations that currently apply and does not impose any new regulations on private property. Enforcement of regulations pertaining to pesticides, drainage, pollution, hunting, fishing, trapping, etc., on private land would continue to be enforced as they were prior to establishment of an Addition to the Refuge. The Service also abides by local regulations the same as any other landowner. In addition, land managed by the Service would be posted to avoid trespass on private land by Refuge visitors.

Service Land Acquisition Policies

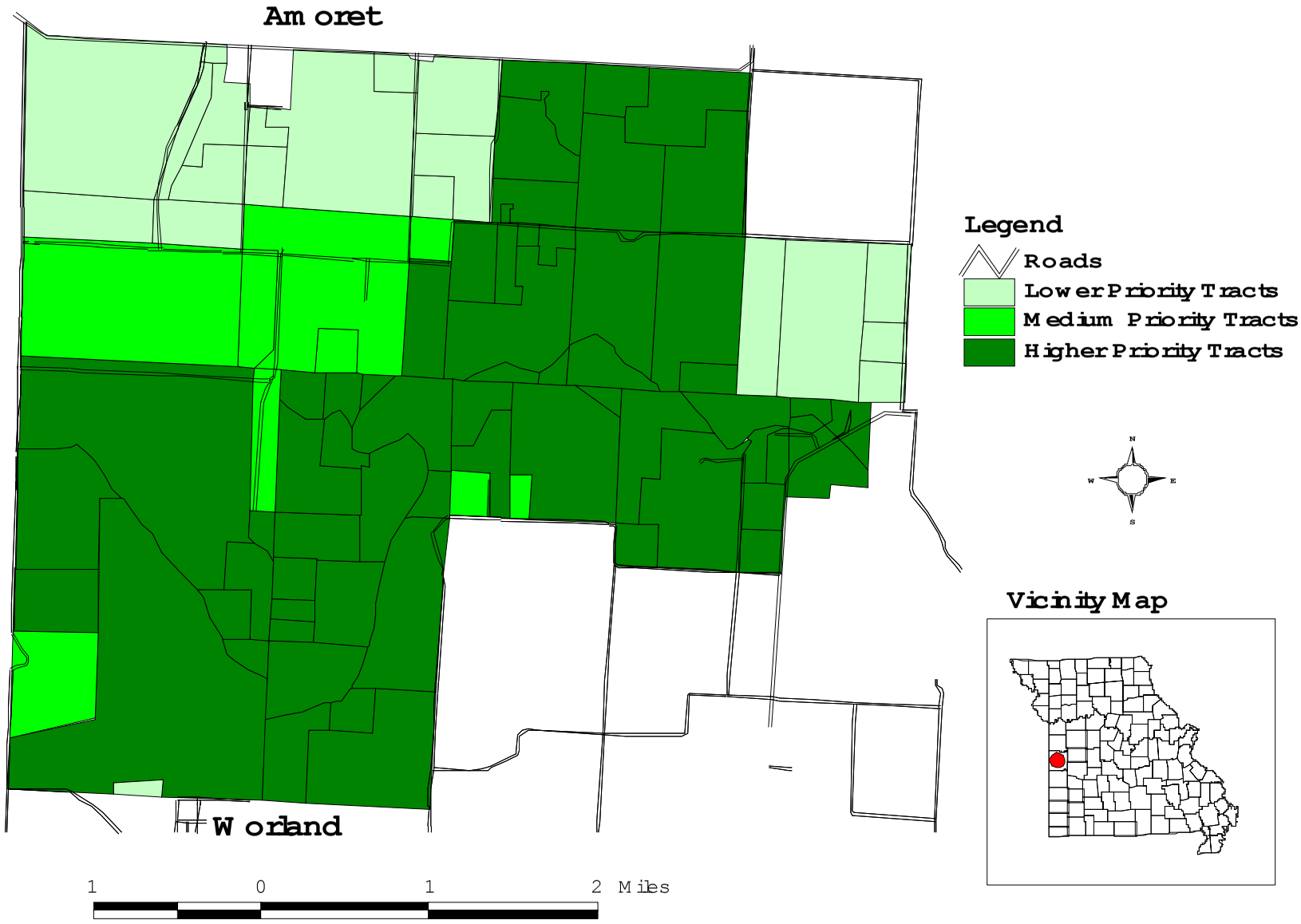
Service policy is to buy land only from willing sellers. No land or rights to land would be acquired without the willing participation of the individual or individuals owning land or rights to the land, including appropriate just-compensation for those rights. The Service is required to make purchase offers based on fair market value, which can be described as matching the price of comparable land in the same area. Condemnation has not been used to acquire any lands for the Marais des Cygnes National Wildlife Refuge in Kansas, which has been purchasing lands for 10 years.

It is also Service policy to seek the least amount of land ownership necessary to meet resource protection goals.

Revenue Sharing Payments

The amount of a Revenue Sharing payment is directly tied to the appraised market value of a property. In some cases, annual payments to local governments

Figure 4: Marais des Cygnes Proposed Addition and Tract Priorities



exceed what the local tax, based on assessed value, would have been if the land was still in private ownership. In other cases, Revenue Sharing payments and supplemental Congressional appropriations fall short of the local assessed property tax revenue. Some members of Congress have recognized this fact and have introduced various bills to remedy the situation. These bills have contained provisions for full funding of the Refuge Revenue Sharing Act. The proposed source of funds would be federal offshore oil and gas lease revenues. However, to date none of these bills have been passed into law.

Effects on Current Drainage Patterns

The Service would not cause any artificial increase of natural water levels or flows without ensuring that the impact would be limited to lands in which the Service has acquired an appropriate real estate interest from a willing seller such as fee title ownership, flowage easement, or cooperative agreement. Thus, none of the alternatives would have negative impacts on drainage from neighboring lands. If Service activities inadvertently create a water-related problem for any private landowner (flooding, soil saturation or deleterious increases in water table height, etc.), the problem would be corrected at the Service's expense.

Water Pumping

No pumping or artificial filling of wetlands is planned. Refuge goals are to restore the natural hydrology of the area. The presence of the Addition Area, when fully restored, should lessen the severity of flooding and increase the duration of flows off of the land during other times of the year. This is expected because natural vegetation and wetlands should slow flood waters and keep soils more moist, thus providing for a higher water table and making water available for a longer period of time.

Crop Depredation

In general, crop depredation would not be expected to increase throughout most of the area. In instances where small fields become surrounded by forest, depredation from deer could increase. However, most bottomland fields are not small and Refuge goals on uplands would be to plant areas into prairie grassland. Wetland development would not likely increase depredation by geese. Goose populations in the area are not limited by the availability of water but by the availability of crops. Only increases in cropland would cause appreciable increases in the goose population. In addition, most restored wetlands would be small and/or forested, which are not preferred by geese. Geese prefer large open wetlands.

Refuge Administration

Any acquired lands would become part of the National Wildlife Refuge System. These lands would be administered by staff at Marais des Cygnes National Wildlife Refuge. The administration office for the Refuge is located along State Highway 52, 3 miles west of Amoret, Missouri, and the Addition area. As the land base increases and the complexity of habitat management and administration increases, additional staff would likely be hired, and management facilities would be constructed within the Addition area. Speaking very generally, a fully staffed refuge of this size would have about seven staff members and an annual operating budget of approximately $700,000.

Impact on Public Roads

The Service does not close roads without approval from the appropriate managing authority, i.e. township, county, or state. Generally, closures are sought only if a road is landlocked by Service property and is a dead end. The current road system would remain the same unless access requires modification sometime in the future. Coordination with state, county, and township officials and residents would be required for any road closure.

Where You Can Find the Draft Environmental Assessment

Copies of the draft EA are available at the following libraries:

Nevada Public Library
Nevada, Missouri

Pleasanton Lincoln Library
Pleasanton, Kansas

Cass County Library – Harrisonville
Harrisonville, Missouri

Butler Public Library
Butler, Missouri

Copies are also available at Marais des Cygnes NWR; feel free to call the Refuge at 913/352-8956 or stop in at 24141 KS Highway 52. The EA is also available online at http://midwest.fws.gov/planning/maraishome.htm.

Tell Us What You Think

Public participation is the cornerstone of conservation planning. By letting us know what you think of the draft EA, you can help the Service write an EA that addresses the issues and opportunities that are important to you.

We want to know if you feel we have addressed the key issues facing the Refuge and District, and whether we have missed any issues. For example, are there opportunities for land protection or habitat management or public use that we have failed to recognize? In reviewing the alternatives considered in the EA, do you agree with our selection of a preferred alternative?

We invite comment on the draft comprehensive conservation plan and this summary. Comments can be submitted electronically through our web site (http://midwest.fws.gov/planning/index.htm) or in writing.

Comments are welcome at any stage throughout this planning effort, but in order for us to consider your comment as we prepare the final environmental assessment, we need to hear from you by April 25, 2003.

Correspondence should be mailed to: Refuge Manager, Marais des Cygnes NWR, Attention: Draft EA Comment, 24141 KS Hwy. 52, Pleasanton, KS 66075